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10/057,963	01/29/2002	Ming-Chung Tang	SUND 256	3618

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EXAMINER

STERRETT, JONATHAN G

ART UNIT	PAPER NUMBER
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3623

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/057,963

Applicant(s)

TANG ET AL.

Examiner

Jonathan G. Sterrett

Art Unit

3623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 February 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5,9-33 and 36-49 is/are pending in the application.
- 4a) Of the above claim(s) 16-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5,9-15,33 and 36-49 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Summary

1. This **Final Office Action** is responsive to the amendment filed 12 February 2007 and the Affidavit filed 20 February 2007. Claims 1-76 are pending the application. Claims 16-31 are withdrawn. Claims 3-4, 6-8, 34-35 and 50-76 are cancelled.

Response to Amendment

2. The 35 USC 112 1st rejections of claims 3, 34 and 50-76 is moot due to the cancellation of these claims.

Response to Argument

3. The 35 USC 112 2nd rejection of Claims 1-32 and 32-76 is withdrawn in response to applicant's arguments. However, please see the new grounds of rejection for 112 2nd below.

4. The applicant's remaining arguments have been fully considered but are not persuasive.

5. The applicant argues that the Tang article used in a 102(b) rejection is insufficient because of an affidavit by the inventors that shows the publishing date of this article in a book to be December 2001.

The examiner respectfully disagrees.

The affidavit under 37 CFR 1.132 filed 20 February 2007 is insufficient to overcome the rejection of claims 1 and 32 based upon 35 USC 102(b) as set forth in the last Office action because:

The affidavit provides a publication date of December 2001 for the reference cited in the 35 USC 102(b) rejection. This publication date is for when the article was published in a book. However, the ACM portal shows the article having another, original publish date of January 2001. Therefore the affidavit is denied and the rejection is maintained. A copy of the ACM.org citation is provided as an attachment to this office action that shows the original published date of the Tang Reference to be January 2001, which is more than one year before the filing date of the instant application.

6. The applicant argues with respect to Claim 1 on pages 30 and 31 that Das fails to teach the claimed limitations.

Applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 2, 5 and 9-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 recites the limitation "the reserved list" in the claim. There is insufficient antecedent basis for this limitation in the claim. For the purposes of examination the examiner assumes this to be "reservation list".

Claims 2, 5 and 9-15 depend on claim 1 and are indefinite at least for the reason given above for Claim 1.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. **Claims 1 and 32** are rejected under 35 U.S.C. 102(b) as being anticipated by **Tang**, Ming-Chung; Chang, R.C.; Shih, Wei-Kuan; "Software Radio System Design for Accessing Wireless Multimedia Services", Dept of Computer Information Science, National Tsin-Hua University, Taiwan, pp.1-12. (hereinafter **Tang**).

Regarding claim 1, Tang discloses:

a regulator for receiving a plurality of tasks for the apparatus according to a first set of parameters;

Figure 4, page 4 illustrates a regulator for receiving a plurality of tasks (denoted as M_1O_1 to M_nO_n). Paragraph 2.2 subpara 1, these tasks are received according to the parameter time T – see the list of parameters (1) through (10).

an on-line scheduler, being coupled to the regulator and having a reservation list, the online scheduler being for receiving at least part of the tasks,

Figure 4, page 4 illustrates an online scheduler that is coupled to the regulator. The online scheduler selects a real-time scheduling method and receives a number of tasks – see also page 6 para 1.

wherein the number of the tasks which are inputted to the on-line scheduler are adjusted by the regulator

page 6, para 1, the tasks inputted to the online scheduler are adjusted by the regulator (note Figure 4 with the suspended/discarded tasks). The tasks are scheduled according to the method (MOS, MOP or MOF).

each of the tasks comprises a mandatory portion and an optional portion,

Figure 4, each of the input tasks, T , have an optional portion and a mandatory portion.

the on-line scheduler is adapted to schedule time intervals in the reservation list for the mandatory portions of the inputted tasks according to the deadlines of the inputted tasks to be executed,

Page 5 subpara 1 & 3, the time intervals in the reservation list are scheduled for mandatory portions according to the deadlines for mandatory options.

the on-line scheduler is adapted to selectively schedules time intervals in the reservation list which are not occupied by the mandatory portions for the optional portions of the inputted tasks,

Page 5 subpara 3, the time intervals in the reservation list are scheduled for optional portions when the mandatory options have been fulfilled, i.e. the k tasks look ahead substitutable.

and the on-line scheduler is adapted to remove the portions from the reservation list sequentially according to the order of the portions in the reservation list.

Page 5 subpara 3, the scheduler of Figure 4 removes the portions of the tasks sequentially according to the particular algorithm for compacting the tasks according to the quality of service algorithm (i.e. which is based on the order of the portions in the reservation list, which reserves bandwidth for the more critical tasks).

an evaluator, coupled to the regulator and the on-line scheduler, for evaluating a scheduling result of the on-line scheduler, feeding the first set of parameters into the regulator for a coarse adjustment, and feeding a second set of parameters into the on-line scheduler for a fine adjustment in which the proportion of the optional portions scheduled in the reserved list is controlled.

Figure 4, the evaluator evaluates the result of the online scheduler and feeds a first set of parameters into the regulator for a course adjustment (see Figure 4) and feeds a second set of parameters into the online scheduler for a fine adjustment. See also page 6 para 1. The adjustments to the scheduler control the degree to which

optional portions are scheduled versus the mandatory portions (see page 4 paragraph 2.2 subpara 1 and 2

Claim 32 recites limitations similar to those addressed by the rejection of **Claim 1** above, and is therefore rejected under the same rationale.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. **Claims 1, 5, 9-15, 32, and 36-49** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Das**, S.K.; Jayaram, R; "A call admission and control scheme for quality-of-service (QoS) provisioning in next generation wireless networks", 2000, Wireless Networks, 6, 1, ABI/INFORM Global, p.17, (hereinafter **Das**).

Regarding **Claim 1**, **Das** teaches:

a regulator for receiving a plurality of tasks for the apparatus according to a first set of parameters;

Figure 2, traffic packets (i.e. tasks) are received and controlled by the admissions controller – according the a bandwidth compaction algorithm (page 22 column 1 para 4), i.e. a first set of parameters.

an on-line scheduler, being coupled to the regulator and having a reservation list, the on-line scheduler being for receiving at least part of the tasks,

Figure 2, the call control block determines whether real time or non real time tasks are scheduled. The call control block is coupled to the admissions controller (i.e. a regulator) to schedule packets and groups of packets that are real-time and non-real-time data – Note Figure 6 on page 22, the use of a “reservation”, i.e. a reservation list, for reserving bandwidth capacity – see also the bandwidth compaction pattern of Figure 4, which is a reservation list, since the tasks are organized in a list according to their order of transmission

wherein the number of the tasks which are inputted to the on-line scheduler are adjusted by the regulator,

page 19 column 2 para 3, the tasks entering the system are allowed to enter by the admissions controller (i.e. a regulator).

each of the tasks comprises a mandatory portion and an optional portion,

Page 18 column 1 para 1, traffic that is communicated over a wireless network includes multimedia transmissions (i.e. where groups of packets being transmitted have mandatory portions) and those transmissions which are not real-time dependent (i.e. where groups of packets have option portions).

the on-line scheduler is adapted to schedule time intervals in the reservation list for the mandatory portions of the inputted tasks according to the deadlines of the inputted tasks to be executed,

page 18 column 2 para 5 & Figure 2 "Call Control Block", the call control block is an online scheduler that schedules tasks according to those that are real-time and non-real-time (i.e. those that are real-time have mandatory deadlines, since the user receiving a real-time video transmission must receive the packets according to a deadline for the packets to be real-time).

the on-line scheduler is adapted to selectively schedules time intervals in the reservation list which are not occupied by the mandatory portions for the optional portions of the inputted tasks,

page 19 column 2 para 1, non-real-time traffic is scheduled according to available bandwidth that is not occupied by the mandatory portions (i.e. the real-time traffic).

Page 20 column 2 para 4, packets (i.e. tasks) include a real time (i.e. mandatory) and non real time (non-real time) packets. The real time portion of the packets is controlled by the scheduler depending on the bandwidth (lower bandwidth available means that the mandatory packets must be transmitted to preserve the real time nature of the media being transmitted – see page 19 column 2 para 1). – see page 21 column 1 para 4, fine adjustment allows for optional (i.e. non real time packets) to be scheduled in with the real time – see Figure 4 on page 21 for an illustration of this).

and the on-line scheduler is adapted to remove the portions from the reservation list sequentially according to the order of the portions in the reservation list.

Art Unit: 3623

Figure 2, the queue information (i.e. the reservation list) provided to the admissions controller provides for information to the packet sorter which removes packets according to the order they are received and placed in order (i.e. sequentially) according to the order in which they are received – see also page 19 column 2 para 5- page 20 column 1 para 2.

an evaluator, for evaluating a scheduling result of the on-line scheduler, feeding the first set of parameters into the regulator for a coarse adjustment, and feeding a second set of parameters into the on-line scheduler for a fine adjustment in which the proportion of the optional portions scheduled in the reserved list is controlled.

Page 20 column 1 para 4, a course set of parameters are used to determine whether and which packets get discarded (e.g. real time vs non-real time) and a fine set of parameters is used to determine compaction of the scheduled time interval for packet transmission – see page 20 column 2 para 2). Since Das is teaching determining which packets are optional and which are mandatory per the set of parameters, this controls the proportion of the optional portions which are scheduled for transmission.

Das teaches the regulation, scheduling and evaluator functions described above but does not teach a second evaluator that is coupled to the regulator and online scheduler.

However, it is old and well known in the art to make devices separable that are integral (see - Nerwin v. Erlichman, 168 USPQ 177, 179 (BdPatApp&Int 1969); In re Dulberg, 129 USPQ 348, 349; 289 F.2d 522 (CCPA 1961))

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Das, regarding having an integral scheduler and evaluator, to make the scheduler and evaluator separate.

Regarding **Claim 5**, Das teaches:

wherein the on-line scheduler selects one of a plurality procedures according to the second set of parameters, the procedures comprising a first procedure in which the mandatory portions of the inputted tasks are executed as soon as possible and the optional portions of the inputted tasks are substitutable,

page 19 column 2 para 1, the mandatory portions (i.e. real-time) of the tasks carried by the wireless network are executed as soon as possible to preserve their real time nature, the other tasks (e.g. email and fax) are substitutable for later bandwidth when there is excess bandwidth because these other tasks can tolerate long delays.

Page 21 column 1 para 3, bandwidth compaction allows for substitutable non critical (non real time packets) into the spaces between the critical real time packets (the

real time packets have to be transmitted (i.e. executed) as soon as possible to preserve the real time latency requirements.

a second procedure in which the mandatory portions of the inputted tasks are executed as soon as possible and the substitutable optional portions of the inputted tasks are postponed, and

page 19 column 2 para 1, the mandatory portions (i.e. real-time) of the tasks carried by the wireless network are executed as soon as possible to preserve their real time nature, the other tasks (e.g. email and fax) are temporarily buffered (i.e. postponed).

Page 21 column 1 para 3, bandwidth degradation (gradual loss of service for non-critical packets) provides for the optional, packets to be postponed. – see also page 21 column 2 para 1 – the amount of bandwidth allocated (i.e. scheduled) to non-real-time applications decreases, thus those packets are postponed. – see also page 19 column 2 para 1 – temporary buffer for non-real time packets.

a third procedure in which the mandatory portion of the inputted tasks are executed as soon as possible and the optional portions of the inputted tasks are to be executed fairly.

page 19 column 2 para 1, the mandatory portions (i.e. real-time) of the tasks carried by the wireless network are executed as soon as possible to preserve their real time nature, the other tasks (e.g. email and fax) can be scheduled according to a weighted fair queueing (page 22 column 2 para 4), ie. fairly.

Regarding **Claim 9**, Das teaches:

wherein the evaluator evaluates the scheduling result of the on-line scheduler according an evaluation standard, and the evaluation standard includes a task rejection rate,

page 22 column 1 para 3, the QoS (Quality of Service) monitoring function provides feedback to the scheduler based on number of handoff drops (i.e. rejection rate)

a task suspend/discard rate,

interference level (i.e. causing a packet to be suspended).

an idle rate,

page 22 column 1 para 2, the level of inactivity in a cell is monitored.

and a slack time.

As discussed above for compaction, the slack time between mandatory packets (i.e. tasks) is used to determine how non mandatory packets are scheduled, as part of the compaction algorithm.

Regarding Claims 10 and 11, Das teaches scheduling for optimized packet transmission in a network but does not teach where scheduling parameters utilize a token generation rate, as per Claim 10 and a token number, as per Claim 11.

However, as noted in the specification, the use of tokens (including a generation rate and number) in scheduling packet transmission is old and well known in the art of

Art Unit: 3623

packet transmission scheduling. This technique is a proven and reliable technique for packet transmission.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the scheduling teachings of Das, regarding scheduling of mandatory packets, to include the step of using a token generation rate, as per Claim 10, and a token number, as per Claim 11, because the token approach to packet transmission provides a reliable and proven way to provide scheduling of packet transmissions.

Regarding **Claim 12**, Das teaches:

wherein the first set of parameters includes a queue length.

Page 19 column 2 para 1, the amount of packets that are awaiting transmission affects the course adjustment (i.e. the balance between real time and non real time transmission). Thus the queue length of packets awaiting transmission affects how many non-real time packets are either buffered (i.e. delayed further) or dropped.

Regarding **Claim 13**, Das teaches:

wherein the second set of parameters includes a real-time scheduling selection parameter.

Page 21 column1 para 3, channel borrowing is a real time scheduling selection parameter in that other, available channels are checked to determine if they can be 'borrowed', i.e. selected, for overflow bandwidth for real time transmissions.

Regarding **Claim 14**, Das teaches:

wherein the second set of parameters includes a substitutable check parameter.

Page 21 column 2 para 5, the partial bandwidth compaction algorithm performs a check on the spectrum to determine if moving a few bandwidth segments to adjoining holes (again see Figure 2), if enough bandwidth can be freed up to satisfy the user's request.

Regarding **Claim 15**, Das teaches:

wherein the second set of parameters includes a parameter indicative of a maximum allowable execution proportion of the optional portion.

Page 21 column 2 para 2, the bandwidth compaction algorithm includes the parameter of finding non real time packets that are smaller than the available "holes" (see Figure 2 on page 21) – thus the maximum allowable parameter includes finding NRT packets smaller than the 'holes'.

Claims 32 and 36-49 recite limitations similar to those addressed in the rejection of **Claims 1, 5 and 9-15** above and are rejected under the same rationale.

12. **Claims 2 and 33** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Das** in view of **Bragg**, Arnold: "Quality of Service, Old Idea, New Options", Sep-Oct 1999, IT Pro, 1999 (C) IEEE, pp.37-44, (hereinafter **Bragg**).

Regarding Claim 2, Das does not teach where the regulator, scheduler and evaluator are hardware devices per se. Regarding Claim 33, Das does not teach where the regulator, scheduler and evaluator are software devices per se.

However, it is old and well known in the art for these functionalities to be provided as either hardware or software devices, as taught by Bragg (see page 38 sidebar "How Queue Management Works", line 1-5).

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide a regulator, scheduler and an evaluator as a hardware device, as per Claim 2, as a software device, as per Claim 33, because it would most effectively provide the appropriate QoS functionality dependent on the implementation scheme, as taught by Bragg.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan G. Sterrett whose telephone number is 571-272-6881. The examiner can normally be reached on 8-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tariq Hafiz can be reached on 571-272-6729. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

Art Unit: 3623

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